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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/724,883	11/28/2000	John Edward Tomaschke	7703-PA02	6918

27111 7590 06/19/2002

BROWN, MARTIN, HALLER & MCCLAIN LLP
1660 UNION STREET
SAN DIEGO, CA 92101-2926

EXAMINER

MENON, KRISHNAN S

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 06/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-4

Office Action Summary	Application No.		Applicant(s)	
	09/724,883		TOMASCHKE, JOHN EDWARD	
	Examiner		Art Unit	
	Krishnan S Menon		1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 1-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-14 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Objections

The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Claim number 14 is missing, and 15-27 are misnumbered. Misnumbered claims 15 – 27 have been renumbered to 14 – 26, respectively. The applicant is requested to make corrections to references to the parent claims in the dependent claims.

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-14, drawn to the process and product by the process, classified in class 264, subclass 48.
- II. Claims 15-26, drawn to the membrane, classified in class 210, subclass 500.21.

The inventions are distinct, each from the other because of the following reasons:

Inventions in group I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the process of making the membrane can be used for making other types of membranes and the membrane can be made with another materially different process. The process used in this

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instant is dipping or immersing in the sulfonic acid solution. Other processes such as spraying or brushing also could provide the desired result. The membrane formed is with sulfonic acid. Similar dipping or immersing could produce membranes with other compounds like other acids or bases, etc.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. James W. McClain, attorney of record, on 6/3/02 and 6/6/02, a provisional election was made with traverse to prosecute the invention of group II, claim 15-26. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-14 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 15-26 are rejected under 35 U.S.C. 103(a) as obvious over Cadotte (US 4,765,897) in view of Koo (US 6,063,278).

Claims 15, 22-25: Cadotte (897) discloses a membrane comprising a porous support layer (col 2: 65-66); a cross-linked polyamide top layer (col 1: 50-60) with a rejection of over 90% at 25C and 200 psi with 15 to 30 GFD flux for 2000 ppm NaCl feed. At 75 psi, this translates to 6 to 12 GFD. Cadotte discloses this membrane to have over 20 GFD flux and over 75% MgSO₄ rejection at 50 psi after treatment with a mineral acid like sulfuric acid. (col 5:5-23). However, Cadotte (897) fails to disclose the use of organic sulfonic acids like MSA or other alkyl or aryl sulfonic acids. Koo (278) teaches the use of a number of organic sulfonic acids including MSA (col 6: 1-8 and examples 1-25, page 7), in making a cross-linked polyamide membrane on a supportive porous understructure made from various polysulfones or similar compounds, as claimed in claim 15-26 by the applicant. Koo, however teaches the addition of the organic sulfonic acid prior to the cross-linking of the polyamide membrane by adding the organic sulfonic acid to the multifunctional amine solution, and then treating the membrane with the multifunctional acid chloride to form the polyamide. Use of Koo's (278) method also indicates substantial increase in flux (over 15 GFD estimated at 75 psi) without any significant loss of NaCl rejection (90%) for 2000 ppm NaCl (example 12, 13, page 7) compared to what is claimed by the applicant in claim 15.

It would be obvious to one of ordinary skill in the art at the time of invention to use Koo's (278) selection of organic sulfonic acids in place of the mineral acid like sulfuric acid as disclosed by Cadotte (897) to make an RO or microfiltration membrane to give enhanced flux. One ordinarily

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skilled in the art at the time if the invention could chose an organic sulfonic acid as taught by Koo (278) instead of sulfuric acid as alternate, but equivalent method of treatment for obtaining enhanced flux as taught by Cadotte.

Claims 16-21, 26: Cadotte (897) discloses multifunctional amines and acid halides (col 3: 16-43), various polysulfone porous supports (col 3: 3-10); thin film composite, spiral wound, etc, (col 3: 55-65); and the salt rejection and flux in terms of MgSO_4 solution. Cadotte discloses a rejection of over 90% with 15-30 GFD flux for 2000 ppm NaCl before the acid treatment. However, Cadotte fails to disclose use of sulfonic acids or the salt rejection in terms of NaCl after the treatment. Koo (278) teaches multifunctional amines and acid halides (col 5: 10-65), various porous supports including polyarylether sulfone (col 4: 39-46); thin film composite (example 1), various sulfonic acids and solvents for sulfonic (all col 6: 1-8); and the NaCl rejection and flux above what is claimed by the applicant in claim 26. It would be obvious to one ordinarily skilled in the art at the time of invention to chose Koo's teachings of use of organic sulfonic acids as alternate but equivalent to Cadotte's use of mineral acids and treat the cross linked polyamide membrane with an organic sulfonic acid to afford the flux and salt rejection as shown by claim 26 of the applicant, or better.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Krishnan S. Menon
Patent Examiner
June 10, 2002


W. L. WALKER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700